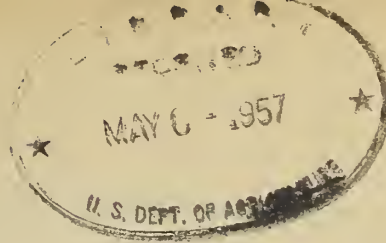


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SNOW SURVEYS AND IRRIGATION WATER FORECASTS

FOR

OREGON

As of April 1, 1937

The following data pertaining to snow surveys and irrigation water-supply forecasts are provided by the Bureau of Agricultural Engineering of the U. S. Department of Agriculture, in cooperation with the Oregon State Engineer, other Federal Bureaus and local organizations. 1/

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INTRODUCTION

During the period from March 26 to April 8 measurements of snow depth and water content were secured on all snow courses in Oregon.

For the reason that a great many of the Oregon courses are but newly established, and in view of the further fact that on very few of the courses do the records extend back for more than a few years, it has been difficult to arrive at definite correlations between water on the ground as snow and subsequent stream flow. In the case of certain stream basins, however, correlations have been made. Full use has been made of correlations developed by engineers of cooperating agencies.

Lacking the extended records on which accurate forecasts must be based, but believing that information accumulated to date is of value in forming general estimates of prospective water supplies for Oregon in 1937, a series of water forecast committee meetings were held in important irrigated regions of Oregon during the period April 5 to 11, as follow: Medford for Southern Oregon; Bend for Central Oregon; Baker for Eastern Oregon; Pendleton for the Umatilla-Walla Walla River Basin. Most of the cooperating agencies were represented at these round-table discussions.

An informal report was prepared of the results of each meeting outlining the irrigation water supply prospects as of April 1 for various Oregon stream basins. The gist of these reports is reproduced herewith. It is understood, of course, that later modifications of the forecasts may be required in accordance with unforeseen deviations of precipitation and temperature from normal during the run-off season.

WATER FORECASTS

Southern Oregon

Measurements of snow at higher levels of the Cascade range above 5,000 feet show about the same average depth and water content as for the past several years at most stations, but about 25 percent less depth and water content than last year. It was brought out that at the high elevations the snow is lying on very dry and unfrozen ground, which indicates that a considerable portion of the snow cover will be required to "prime" these mountain soils. At elevations of 5,000 feet the snow measurements indicate approximately the same water content as last year, and at elevations from 3,000 to 5,000 feet, the measurements show more snow with a greater water content than was found last year. Assuming that spring precipitation and general weather conditions will be normal, the streams flowing into the Medford area should have approximately 80% normal run-off. Due to favorable water conditions last year, the Medford, Rogue River, and Talent Districts were able to complete the irrigation season with water in storage and this hold over storage will a little more than offset the expected decrease in stream flow for 1937. The following table shows the maximum storage obtained during 1936 as contrasted with the forecasted maximum storage for 1937 in the different storage reservoirs of the Medford, Talent and Rogue River Districts:

The first of the year was a very dry one, and the crops were much injured. The weather was very hot, and the ground was very dry. The crops were much injured, and the yield was very small. The weather was very hot, and the ground was very dry. The crops were much injured, and the yield was very small.

The second of the year was a very wet one, and the crops were much injured. The weather was very cold, and the ground was very wet. The crops were much injured, and the yield was very small. The weather was very cold, and the ground was very wet. The crops were much injured, and the yield was very small.

The third of the year was a very dry one, and the crops were much injured. The weather was very hot, and the ground was very dry. The crops were much injured, and the yield was very small. The weather was very hot, and the ground was very dry. The crops were much injured, and the yield was very small.

The fourth of the year was a very wet one, and the crops were much injured. The weather was very cold, and the ground was very wet. The crops were much injured, and the yield was very small. The weather was very cold, and the ground was very wet. The crops were much injured, and the yield was very small.

The fifth of the year was a very dry one, and the crops were much injured. The weather was very hot, and the ground was very dry. The crops were much injured, and the yield was very small. The weather was very hot, and the ground was very dry. The crops were much injured, and the yield was very small.

1936

1937

| | | |
|----------------|----------------|----------------|
| Fish Lake | 7,600 ac. ft. | 7,500 ac. ft. |
| Four Mile Lake | 14,600 ac. ft. | 15,000 ac. ft. |
| Hyatt Prairie | 9,600 ac. ft. | 10,000 ac. ft. |
| Emigrant Gap | 8,200 ac. ft. | 8,200 ac. ft. |

The anticipated summer flow of Rogue River from April 1 - September 30, 1937, available to lower irrigated lands is expected to be about 20 percent less than that of the same period for last year. A lower gage height is expected on Rogue River during August and September of this year than was the case last year. However, due to the snow pack at low elevations exceeding that of last year by a material margin, the flush spring run-off of tributaries to Rogue River is expected to be greater and extend about three weeks later than last year.

The natural run-off for Little Butte Creek for the April 1 - September 30, 1937 period is set at 96% of normal. Last year the run-off of this tributary of Rogue River was 128 percent of normal. The flow this year is expected to be only 75 percent of that of last year.

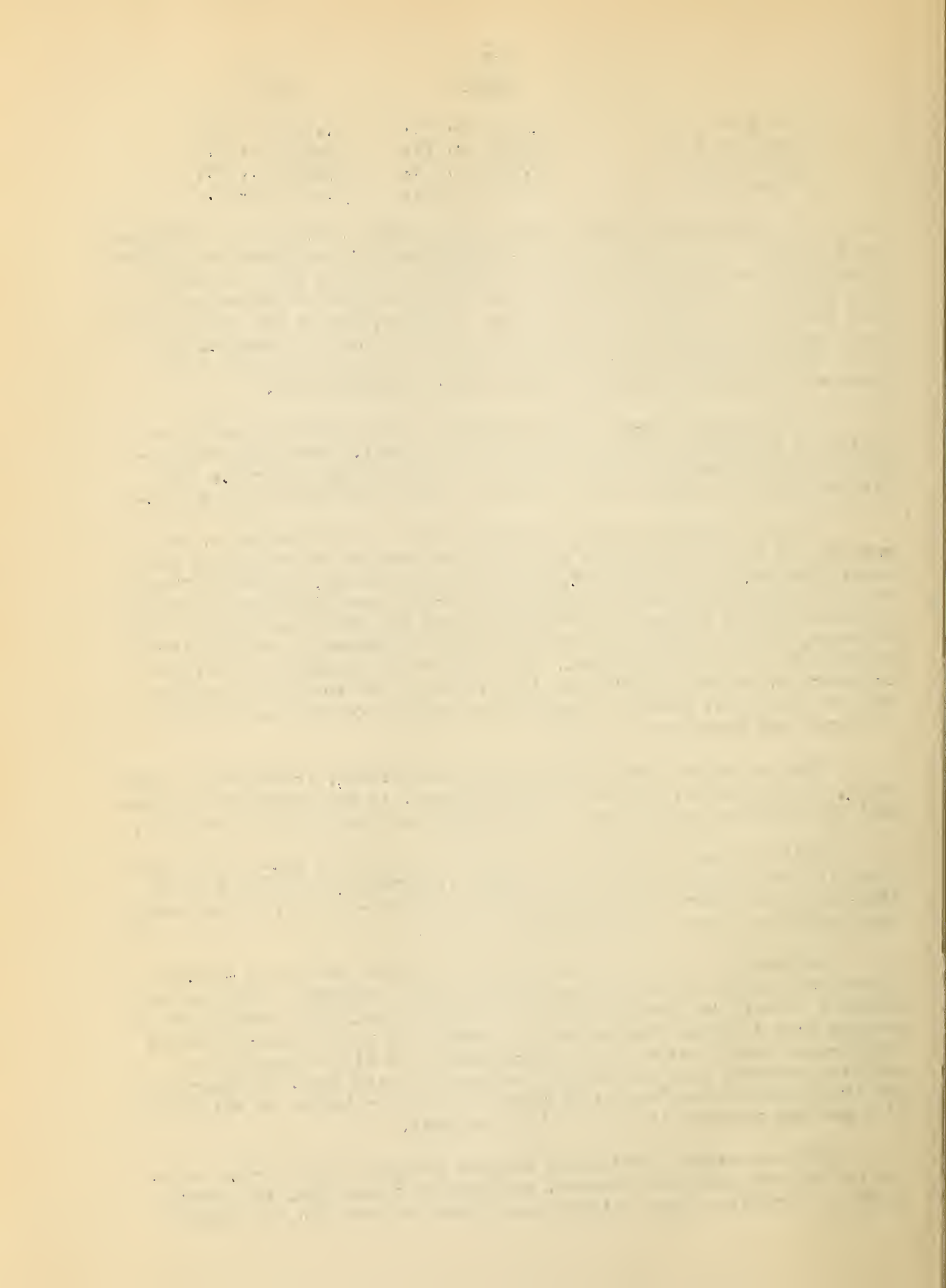
In the watershed of the Applegate River, and tributaries, the snow at the higher elevations has about the same water content as last year. However, as pointed out, this snow lies on dry, unfrozen ground and it is expected that the run-off from these snow fields will need to be discounted to compensate for the existing dry soil conditions. This discount, however, will be partially offset by favorable soil moisture conditions at lower elevations. The flow of the Applegate River, and tributaries, at low summer stage is expected to be somewhat less than that of last year, and the low flow may be 20 percent less than that of August and September of 1936.

The low water flow of Evans and Graves Creeks, tributaries to the Rogue, and Cow Creek, tributary to the Umpqua, is not expected to exceed that of last year and may even be slightly less than that of last year.

While in some respects the situation shows that run-off for Rogue River and for Applegate River, and their tributaries, will need to be discounted this year, it is believed that the run-off will not be enough less than last year to warrant undue concern.

In spite of a fall and winter precipitation deficiency of 3.27 inches from normal to date, very favorable soil moisture conditions are known to prevail in farm lands of the Medford area. This conclusion is reached from detailed studies of soil conditions in 30 orchard blocks. The surface three feet of soil is practically at field capacity and contains somewhat more water than last year at this time. Moisture in the third foot horizon was at 88 percent of the available by the middle of March and probably is now at field capacity.

The water-table throughout orchard sections of the area, as revealed by test well measurements, has receded since 1936, the average depth of recession being slightly more than one foot for the valley



floor average. In the orchard region near Talent, the water-table has dropped about four feet from the level held in February, 1936. Drainage conditions, with some exceptions, are considered favorable to crop growth.

In the Upper Klamath Basin, water in the form of snow appears to be about the same as last year at this time, but net inflow into Upper Klamath Lake is about 17 percent less at this time than it was a year ago. Due to the extended drought in the fall of 1936, somewhat less inflow into Klamath Lake is expected than last year. Therefore, subject to unforeseen conditions, and assuming normal spring precipitation, 1936-37 net inflow into Upper Klamath Lake is estimated at 800,000 acre feet, which represents a 20 percent decrease over that of last year and is equivalent to 63 percent of normal. However, even under these conditions, this quantity will prove ample for all normal irrigation requirements.

The estimated inflow into Gerber Reservoir should provide an abundant supply for the irrigation of all lands served from this reservoir, and, in addition, there should be considerable carry-over for use in 1938. The same forecast will apply to the Clear Lake Reservoir.

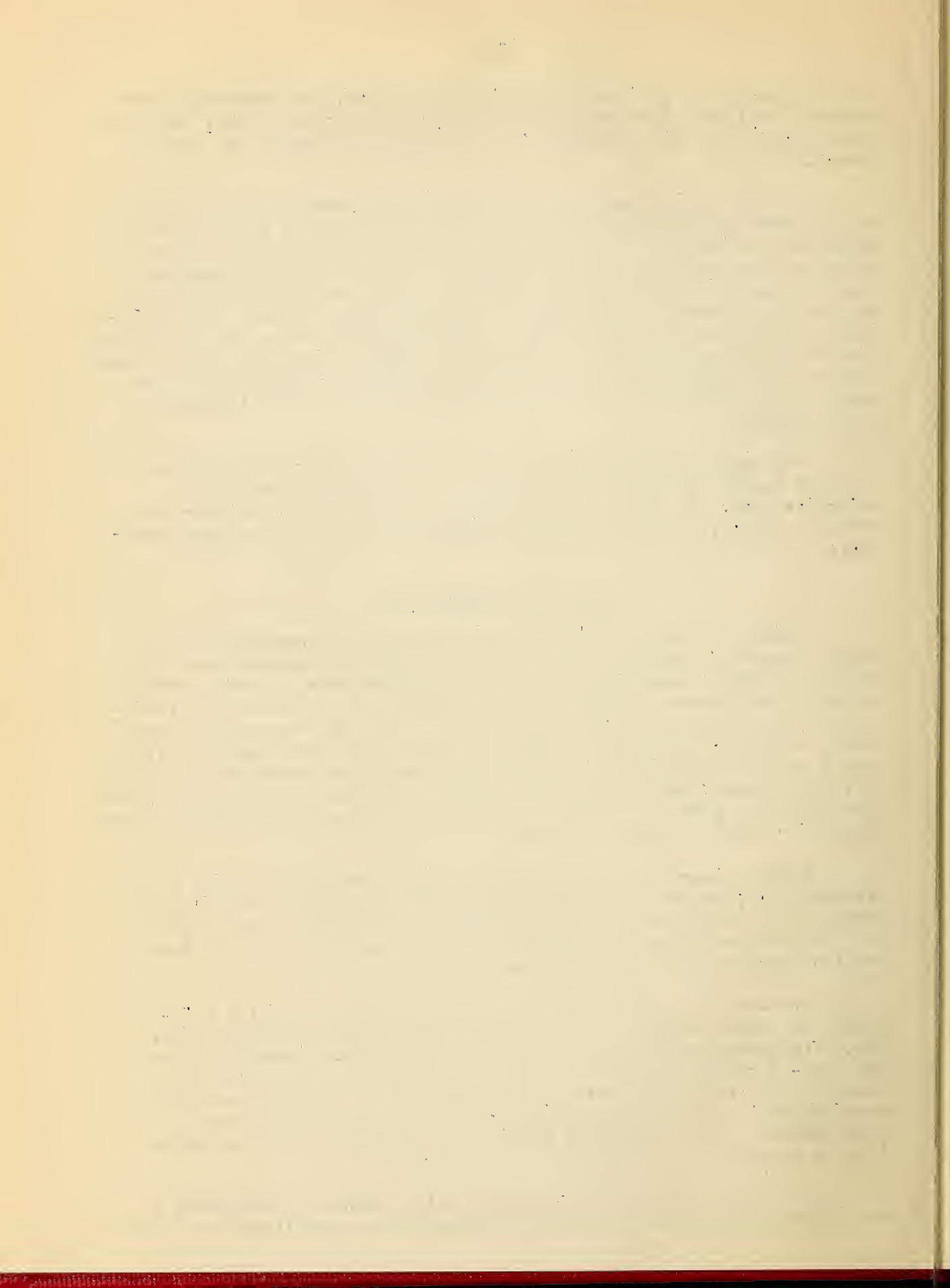
Deschutes River Basin

Studies of snow cover for the drainage area contributing to the Ochoco Reservoir show that there is a twenty percent greater snow depth and water content than last year. However, there was a greater early inflow to the reservoir last year than during 1937 to date. The reservoir began to fill on January 5 last year as against February 20 this year. On April 1, 1936, the storage in Ochoco was approximately 11,000 acre feet as against 5,000 acre feet this year. The snow last year lay on frozen ground, whereas this year the snow fell on dry unfrozen ground. A considerable part of the snow is soaking into the ground this year instead of running into the reservoir,

Ochoco Reservoir is expected to peak in storage this year at a minimum of 18,000 acre feet as against 24,000 acre feet last year. However, if exceptionally favorable run-off conditions prevail during the next six weeks the storage to be expected may be materially increased over the forecasted amount.

Snow-water conditions at Three Creeks Meadows near the headwaters of Squaw Creek are over twenty percent better than last year, and, barring unforeseen weather conditions, the total run-off for the April 1 - September 30 period should exceed that of last year. Unusually heavy prolonged drifting took place in the mountainous region near Broken Top during the past winter, resulting in above normal snow accumulation in sheltered locations. The prospective low water flow is therefore expected to hold up well.

The flow of Little River and the main Deschutes is expected to be a little better than last year even though snow conditions are about



the same as last year. The soil of the watershed was very dry last fall, but, to compensate for this factor, the snowfall at Cascade Summit, as shown by snow measurements, has nearly approached normal during the period 1935-37, and ground water supplies which were thereby replenished are expected to aid in holding up the late summer flow of Little River and the main Deschutes during 1937.

Crane Prairie Reservoir is now full to the capacity limited by agreement, as compared with a figure of eighty-eight percent full last year at this time. Crescent Lake Reservoir is expected to peak in storage at about the same elevation as in 1936, at fifty percent of capacity. However, if exceptionally favorable run-off conditions prevail during the next six weeks, Crescent Lake Reservoir is expected to peak in storage at a point above fifty percent of capacity.

Soil moisture conditions prevailing in cultivated lands of the Deschutes River Valley are excellent and better than last year. The soil moisture condition of cropped lands in the Tumalo project is the best in many years. This is considered as favorable to the delayed use of water from storage. While the seasonal precipitation at Bend is somewhat below normal, there have been relatively heavy and effective rains during March which have brought soil moisture to a favorable point.

Stock water and grazing conditions in the Harney Valley near Burns are better than for several years, due to recent heavy rains bringing off the snow at the lower elevations. Favorable spring soil moisture conditions are reported in the area near Madras, and reports indicate a moisture penetration in Jefferson County grain lands of 14-16 inches, which appears better than usual.

Heavy snows at low elevations during the past winter should create a very favorable condition for spring grazing on the Ochoco range.

Eastern Oregon

Studies of snow cover for the mountain areas in Nevada and Idaho from which the Owyhee Reservoir draws its supplies indicate that a total run-off for this year of 35 percent of last year may be expected. However, a very substantial reserve supply was held in Owyhee Reservoir at the close of the 1936 irrigation season, and inflow since that time has brought the reservoir to one hundred percent (100%) of capacity. Due to the extremely dry condition of soil on the Owyhee watershed last year, it is believed that the discharge of Owyhee River this year will be only about one-third of the flow in 1935.

Snow water conditions near the headwaters of the Malheur River are not as good as last year by at least a third. In addition to this, the snow is lying on ground which is unfrozen and was very dry up to mid-winter.

It is estimated that, barring unforeseen weather conditions, the total run-off of the Malheur River for 1936-37 will not exceed that of

1934-35 and probably will be thirty percent (30%) less than last year. Agency Reservoir is expected to peak in storage at 40,000 acre feet and Warm Springs Reservoir at 80,000 acre feet, providing favorable run-off conditions prevail during the next six weeks. However, if prolonged drying winds should occur this year as in May, 1936, the run-off into the reservoirs may be reduced from the forecasted amount.

The run-off from Burnt River available for irrigation is not expected to equal that of last year, but should be fifty percent (50%) better than 1935. The April - June inclusive run-off is expected to be eighty-five percent (85%) of last year.

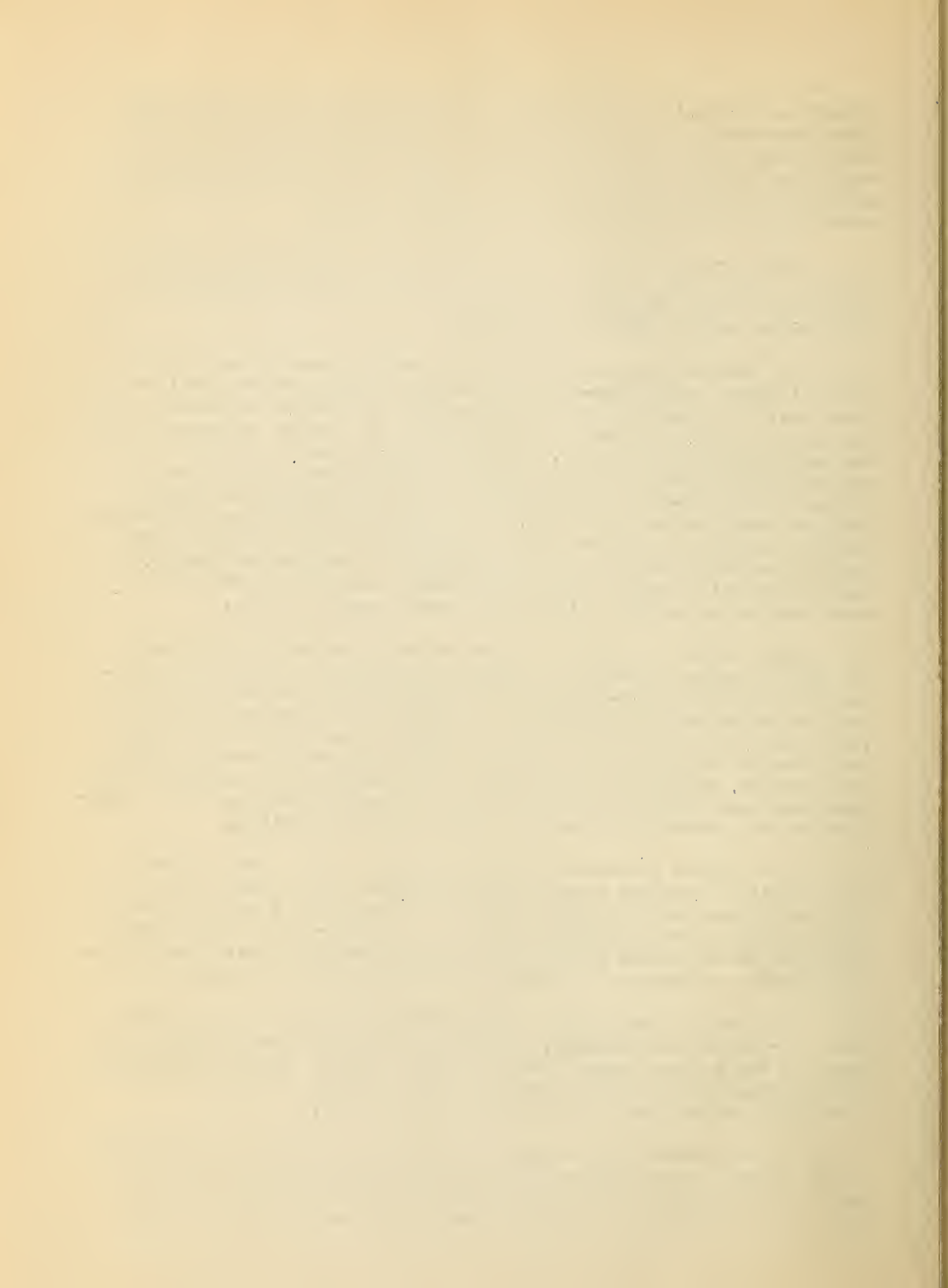
The streams feeding the Powder and Grande Ronde Valleys are expected to have a total run-off not to exceed eighty percent (80%) of last year. Snow conditions in the mountains at high elevations are about the same as last year, but the snow is lying on unfrozen ground which was dry until very late last fall. However, the snow cap has receded to a higher elevation than was true last year at this time, and not as large a flush spring run-off as obtained last year is expected this spring, provided spring rains are normal. The winter snow at low elevations was heavier this year than last. While the snow has melted without appreciably increasing stream flow it has resulted in thoroughly "priming" the low elevation mountain soils, and this is expected to result in a sustained low water flow which may be better than last year.

Snow depths and water contents on the headwaters of the south and middle fork of the John Day River are somewhat less than last year, but the prospective run-off from these portions of the John Day River may need to be further discounted on account of the dry soil condition prevailing until snow fell early last winter. The total run-off of the main John Day is expected to be only about seventy-five percent (75%) of last year, but the low water flow of the stream is not expected to be less than last year and probably will be somewhat better due to the lower parts of the watershed having been well soaked this spring.

Snow depths and water contents, as well as the total seasonal precipitation, are near normal on the watershed of the North Fork of John Day River, and the prospective flow of the North Fork is estimated at eighty-five percent (85%) of last year. However, the lower tributaries of the John Day, even under the most favorable conditions affecting run-off are expected to provide an insufficient low water flow.

The forest lands in the Malheur Forest are in excellent condition as regards soil moisture. Exceptionally heavy snow drifting took place in the Malheur Forest during the past winter. This probably will be an influencing factor for the sustained low flow of streams in the John Day watershed during low water period in 1937.

In the Harney Basin moisture remaining in the form of snow lying on the ground on the Silvies River and the Silver Creek watersheds is only about seventy percent (70%) of that at the same date last year. Most of the snow on the lower hills melted and went into the ground,



very little finding its way to the streams. The soil of the valley floor as well as the hills is well filled with moisture and a precipitation of 2.3 inches at Burns since March 1st had made conditions very favorable for seeding of grain crops. The total flow of Silvies River is not expected to be more than seventy percent (70%) of that of last year, but due to the amount of water stored in the ground, the summer flow should be as good as last year.

Umatilla - Walla Walla Basin

Snow depth and water content on the headwaters of the Walla Walla River are considerably less than last year, but the flow of the Walla Walla probably will not be reduced in direct proportion to the difference between this year's snowfall and last, inasmuch as other snow measurements at other locations in the Blue Mountains do not show as great a reduction in snow water content as on the Tollgate snow station. Detailed run-off forecast for 1937 by watersheds is as follows:

| | | | |
|-------------------------------|---------|------|------|
| The Umatilla River, Pendleton | 250,000 | acre | feet |
| McKay Creek | 45,000 | " | " |
| South Walla Walla River | 120,000 | " | " |

McKay Reservoir is expected to peak in storage at 45,000 to 50,000 acre feet, or at about the same content as reached last year.

1887

1. The first of the year was a very dry one, and the crops were much injured by the drought. The weather was very hot, and the crops were much injured by the drought. The weather was very hot, and the crops were much injured by the drought.

2. The second of the year was a very wet one, and the crops were much injured by the rain. The weather was very cold, and the crops were much injured by the rain. The weather was very cold, and the crops were much injured by the rain.

3. The third of the year was a very dry one, and the crops were much injured by the drought. The weather was very hot, and the crops were much injured by the drought. The weather was very hot, and the crops were much injured by the drought.

Status of precipitation as of October 1 to date:

| Month | Oct. | | Nov. | | Dec. | | Jan. | | Feb. | | Mar. | | Period | |
|-----------|------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|--------|-------|
| Section | P | D | P | D | P | D | P | D | P | D | P | D | F | D |
| S. E. | 0.00 | -0.64 | 0.04 | -0.82 | 0.54 | -0.43 | 0.89 | -0.10 | 1.05 | +0.29 | 1.97 | +0.73 | 4.49 | -0.97 |
| S. C. | 0.00 | -0.89 | T | -1.53 | 0.78 | -0.77 | 1.31 | -0.58 | 2.00 | +0.50 | 1.33 | +0.17 | 5.42 | -3.10 |
| N. C. | 0.02 | -0.64 | 0.28 | -0.92 | 1.00 | -0.41 | 1.88 | -0.13 | 0.92 | -0.22 | 1.76 | +0.89 | 5.86 | -1.43 |
| Col. Riv. | 0.04 | -0.81 | 0.07 | -1.71 | 1.35 | -0.31 | 1.89 | -0.15 | 0.99 | -0.49 | 1.40 | +0.39 | 5.74 | -2.69 |
| Wal. Mts. | 0.13 | -1.22 | T | -1.81 | 1.59 | -0.45 | 2.15 | +0.24 | 1.33 | -0.61 | 1.98 | +0.58 | 7.68 | -2.67 |
| Blue Mts. | 0.11 | -1.29 | 0.12 | -1.82 | 1.95 | -0.24 | 2.83 | +0.30 | 2.24 | +0.27 | 2.46 | +0.39 | 9.71 | -2.39 |
| Southern | 0.00 | -2.08 | 0.04 | -3.94 | 3.46 | -0.69 | 3.27 | -0.80 | 3.95 | +0.64 | 2.80 | +0.77 | 13.53 | -6.10 |
| Area | | | | | | | | | | | | | 7.49 | -2.76 |

P Precipitation

D - Departure

S. E. - Southeastern Oregon range lands, Harney and Malheur Counties
 S. C. - Southcentral Oregon range lands, Lake County and Klamath County, except the Cascade Mountains.
 N. C. - Northcentral Oregon wheat and range lands, Crook, Deschutes, Jefferson, Wheeler and part of Grant Counties.
 Col. Riv. - Columbia River area wheat and range lands, Gilliam, Morrow, Sherman, Wasco, and part of Umatilla Counties.
 Wal. Mts. - Walla Walla Mountain area forest and range lands, Walla Walla and part of Baker County.
 Blue Mts. - The Blue Mountain forest and range area, Union and parts of Baker, Grant and Umatilla Counties.
 Southern - Southern Oregon irrigated section, Jackson and Josephine Counties.

Note: Data for the last month shown above are preliminary only, as they are based on a few stations only.
 Data for earlier months have been corrected to include all the stations in climatological data for the area.

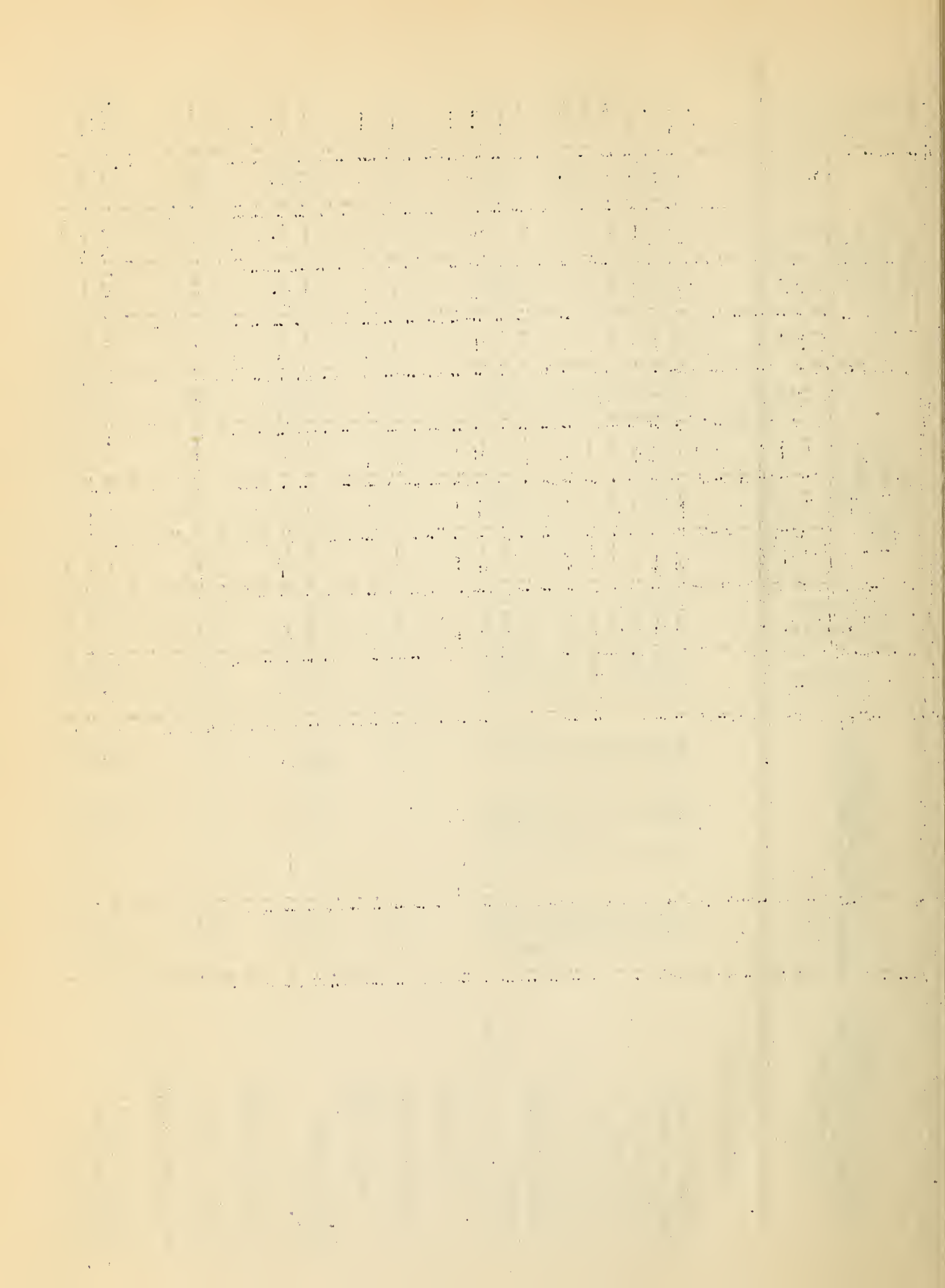
TRIBUTARY BASINS
(Primary & Secondary
& Snow Courses)

| TRIBUTARY BASINS (Primary & Secondary & Snow Courses) | Number | Sec. | Twp. | Range | LOCATION | Elevation | -8- | Last Survey | AVERAGE SNOW DEPTH (Inches) 1937 | | | | AVERAGE WATER DEPTH (Inches) 1937 | | | | Water Depth 1936 (Inches) | |
|---|--------|------|------|-------|----------|-----------|-----|-------------|---|------|------|------|--|------|------|------|------------------------------|------|
| | | | | | | | | | Date 1937 | Jan. | Feb. | Mar. | Apr. | Jan. | Feb. | Mar. | | Apr. |
| | | | | | | | | | | | | | | | | | | |
| UPPER COLUMBIA DRAINAGE | | | | | | | | | | | | | | | | | | |
| LOWER SNAKE IN OREGON | | | | | | | | | | | | | | | | | | |
| OXYHEE RIVER | | | | | | | | | | | | | | | | | | |
| Big Bend | Nev. | 30 | 45N | 56E | 6800 | 4-2 | 30 | 33 | 30 | 33 | 30 | 33 | 30 | 33 | 30 | 33 | 30 | 33 |
| Buckskin, Lower | Nev. | 25 | 45N | 39E | 6800 | 3-2 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| Buckskin, Upper | Nev. | 14 | 45N | 39E | 8200 | 3-31 | 23 | 19 | 23 | 19 | 23 | 19 | 23 | 19 | 23 | 19 | 23 | 19 |
| Fry Canyon | Nev. | 32 | 43N | 54E | 6800 | 3-4 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 |
| Gold Creek Ranger Sta. | Nev. | 32 | 45N | 56E | 6600 | 2-28 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |
| Granite Peak | Nev. | 27 | 44N | 39E | 8600 | 3-3 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28 |
| Jack Creek, Lower | Nev. | 19 | 42N | 53E | 7000 | 2-27 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| Jack Creek, Upper | Nev. | 9 | 42N | 53E | 7300 | 2-27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 |
| Martin Creek | Nev. | 24 | 44N | 39E | 7000 | 2-28 | 21 | 21 | 21 | 21 | 21 | 21 | 21 | 21 | 21 | 21 | 21 | 21 |
| Rodeo Flat | Nev. | 31 | 43N | 54E | 7000 | 3-5 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 |
| Silver City | Idaho | 6 | 5S | 3W | 6400 | 2-28 | 17 | 38 | 48 | 48 | 48 | 48 | 48 | 48 | 48 | 48 | 48 | 48 |
| South Mountain | Idaho | 19 | 9S | 5W | 5100 | | | | | | | | | | | | | |
| Steens Mountain (4963) | Oregon | 35 | 32S | 33E | 6000 | | | | | | | | | | | | | |
| Taylor Canyon | Nev. | 32 | 39N | 53E | 5200 | 3-2 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 |
| KALHEUR RIVER | | | | | | | | | | | | | | | | | | |
| Blue Mountain Spring | 133 | 21 | 15S | 35E | 5900 | 3-31 | 17 | 43 | 38 | 46 | 38 | 46 | 38 | 2.9 | 8.2 | 15.3 | 16.1 | 18.2 |
| Eldorado Summit | 131 | 14 | 14S | 38E | 4600 | | | | | | | | | | | | | |
| Rock Spring | 134 | 23 | 18S | 32E | 5100 | 3-31 | 9 | 21 | 27 | 27 | 9 | 27 | 9 | 4.2 | 7.9 | 3.9 | 3.9 | 9.1 |
| BURNT RIVER | | | | | | | | | | | | | | | | | | |
| Blue Mountain Summit | 141 | 6 | 12S | 36E | 5098 | 3-29 | 13 | 30 | 32 | 32 | 18 | 32 | 18 | 3.0 | 6.3 | 9.3 | 6.1 | 9.6 |

| TRIBUTARY BASINS (Primary & Secondary & Snow Courses) | Number | Sec. | Twp. | Range | LOCATION | Elevation | Last Survey Date 1937 | AVERAGE SNOW DEPTH (Inches) | | | | AVERAGE WATER DEPTH (Inches) | | | | Water Depth 1936 (Inches) |
|---|--------|------|------|-------|----------|-----------|--------------------------|-----------------------------------|------|------|------|------------------------------------|------|------|------|------------------------------------|
| | | | | | | | | 1937 | | | | 1937 | | | | |
| | | | | | | | | Jan. | Feb. | Mar. | Apr. | Jan. | Feb. | Mar. | Apr. | |
| POWDER RIVER | | | | | | | | | | | | | | | | |
| Anthony Lake | 155 | 18 | 7S | 37E | 7125 | 4-6 | 4-6 | -- | -- | -- | 92 | -- | -- | -- | 28.3 | 24.9 |
| Bourne | 154 | 33 | 8S | 37E | 5800 | 3-29 | 3-29 | 17 | 42 | 48 | 32 | 3.7 | 8.4 | 10.2 | 10.5 | 18.3 |
| GRANDE RONDE RIVER | | | | | | | | | | | | | | | | |
| Aneroid Lake | 183 | 16 | 4S | 45E | 6500 | 3-28 | 3-28 | -- | 43 | -- | 79 | -- | 5.3 | -- | 27.9 | 32.5 |
| Summit Springs | 184 | 9 | 6S | 37E | 6000 | 4-8 | 4-8 | -- | -- | -- | 75 | -- | -- | -- | 25.7 | 24.0 |
| LOWER COLUMBIA DRAINAGE | | | | | | | | | | | | | | | | |
| WALLA WALLA RIVER | | | | | | | | | | | | | | | | |
| Toll Gate | 212 | 33 | 4N | 38E | 6300 | 3-17 | 3-17 | -- | 60 | -- | 58 | -- | 16.6 | -- | 25.9 | 41.1 |
| UMATILLA RIVER | | | | | | | | | | | | | | | | |
| Emigrant Springs | 222 | 29 | 1N | 35E | 4600 | 3-24 | 3-24 | -- | 35 | -- | 18 | -- | 7.6 | -- | 7.9 | 9.6 |
| Near Meacham | 221 | 24 | 1S | 35E | 4600 | 3-24 | 3-24 | -- | 37 | -- | 31 | -- | 9.3 | -- | 12.8 | 13.3 |
| JOHN DAY RIVER | | | | | | | | | | | | | | | | |
| Anthony Lake | 155 | 18 | 7S | 37E | 7125 | 4-6 | 4-6 | -- | -- | -- | 92 | -- | -- | -- | 28.3 | 24.9 |
| Arbuckle Mountain | 241 | 33 | 4S | 29E | 5400 | 3-31 | 3-31 | -- | 51 | -- | 47 | -- | 14.1 | -- | 18.7 | 14.6 |
| Beech Creek Summit | 246A | 4 | 12S | 30E | 4912 | 3-29 | 3-29 | 7 | 28 | 32 | 19 | 1.0 | 4.9 | 10.7 | 8.4 | 2.3 |
| Blue Mountain Spring | 133 | 21 | 15S | 35E | 5900 | 3-31 | 3-31 | 17 | 43 | 46 | 38 | 2.9 | 8.2 | 15.3 | 16.1 | 18.2 |
| Blue Mountain Summit | 141 | 6 | 12S | 36E | 5098 | 3-29 | 3-29 | 13 | 30 | 32 | 18 | 3.0 | 6.3 | 9.3 | 6.1 | 9.6 |
| Dixie Springs | 244 | 28 | 11S | 34E | 6000 | 3-30 | 3-30 | -- | -- | -- | 59 | -- | -- | -- | 22.4 | 24.9 |
| Izee Summit | 964 | 28 | 16S | 29E | 5293 | 3-30 | 3-30 | 11 | 27 | 31 | 21 | 1.1 | 5.5 | 8.3 | 7.5 | 10.5 |
| Olive Lake | 245 | 14 | 9S | 33E | 6000 | 3-31 | 3-31 | 18 | 44 | 49 | 51 | 3.4 | 8.4 | 16.0 | 17.1 | 19.3 |
| Star Ridge | 247 | 29 | 15S | 31E | 5193 | 3-30 | 3-30 | 8 | 23 | 25 | 12 | 0.8 | 4.4 | 7.3 | 4.4 | 4.4 |

TRIBUTARY BASINS
(Primary & Secondary
& Snow Courses)

| TRIBUTARY BASINS (Primary & Secondary & Snow Courses) | LOCATION | | Elevation | Last Survey Date 1937 | AVERAGE SNOW DEPTH (Inches) 1937 | | | | AVERAGE WATER DEPTH (Inches) 1937 | | | | Water Depth 1936 (Inches) | | | |
|---|----------|-----------------|-----------|--------------------------|---|------|------|------|--|------|------|------|---------------------------------|------|------|------|
| | Number | Sec. Twp. Range | | | Jan. | Feb. | Mar. | Apr. | Jan. | Feb. | Mar. | Apr. | | | | |
| | | | | | | | | | | | | | | | | |
| DESCHUTES RIVER | | | | | | | | | | | | | | | | |
| Caldwell Ranch | 326 | 30 | 21S | 8E | 4400 | 3-29 | -- | -- | -- | -- | 26 | -- | -- | 13.2 | -- | |
| Cascade Summit | 321 | 7 | 23S | 6E | 5200 | 3-29 | -- | 93 | -- | -- | 77 | -- | 25.1 | -- | 32.5 | 36.0 |
| Charlton Lake | 327 | 23 | 21S | 6E | 5750 | 3-29 | -- | -- | -- | -- | 80 | -- | -- | -- | 30.7 | -- |
| Clear Lake | 361 | 29 | 4S | 9E | 3500 | 4-1 | -- | -- | -- | -- | 40 | -- | -- | -- | 18.3 | 16.3 |
| Crescent Lake | 325 | 11 | 24S | 6E | --- | 3-29 | -- | 51 | -- | -- | 22 | -- | 11.0 | -- | 9.3 | 9.4 |
| Derr | 343 | 14 | 13S | 23E | 5670 | 3-31 | -- | -- | -- | -- | 40 | -- | -- | -- | 14.7 | -- |
| New Dutchman Flat | 324A | 21 | 18S | 9E | 6400 | | | | | | | | | | | |
| Ochoo Meadows | 341 | 21 | 13S | 20E | 5200 | 3-25 | 30 | 45 | -- | -- | 45 | 6.1 | 13.6 | -- | 15.0 | 12.6 |
| Tamarack | 342 | 8 | 15S | 25E | 4600 | 3-31 | -- | 26 | 20 | -- | 11 | -- | 4.9 | 7.2 | 3.9 | -- |
| Three Creeks Meadows | 331 | 10&11 | 17S | 9E | 6038 | 3-30 | -- | 64 | -- | -- | 63 | -- | 18.5 | -- | 26.1 | 21.5 |
| HOOD RIVER | | | | | | | | | | | | | | | | |
| Brooks Meadows | 431 | 2 | CS | ICE | 4300 | 3-20 | -- | -- | -- | -- | 36 | -- | -- | -- | 15.5 | -- |
| SANDY RIVER | | | | | | | | | | | | | | | | |
| Still Creek | 451 | 25 | 3S | 8 $\frac{1}{2}$ E | 4000 | 3-29 | -- | -- | -- | -- | 47 | -- | -- | -- | 23.9 | -- |
| Mt. Hood | 452 | -- | -- | -- | 5600 | 4-5 | -- | -- | -- | -- | 153 | -- | -- | -- | 67.4 | -- |
| CLACKAMAS RIVER | | | | | | | | | | | | | | | | |
| Feavine Ridge | 591 | 14 | 6S | 7E | 3500 | 3-20 | -- | -- | -- | -- | 55 | -- | -- | -- | 25.2 | -- |
| WILLAMETTE RIVER | | | | | | | | | | | | | | | | |
| Cascade Summit | 321 | 7 | 23S | 6E | 5200 | 3-29 | -- | 93 | -- | -- | 77 | -- | 25.1 | -- | 32.5 | 36.0 |
| Charlton Lake | 327 | 23 | 21S | 6E | 5750 | 3-29 | -- | -- | -- | -- | 80 | -- | -- | -- | 30.7 | -- |
| Waldo Lake | 521 | 8 | 21S | 6E | 5460 | 3-28 | -- | -- | -- | -- | 78 | -- | -- | -- | 29.0 | -- |



| TRIBUTARY BASINS (Primary & Secondary & Snow Courses) | Number | LOCATION : Sec. Twp. Range | Elevation | Last Survey Date 1937 | AVERAGE SNOW DEPTH (Inches) | | | | AVERAGE WATER DEPTH (Inches) | | | | Water Depth 1936 (Inches) |
|---|--------|-------------------------------|-----------|--------------------------|-----------------------------------|------|------|------|------------------------------------|------|------|------|------------------------------|
| | | | | | Jan. | Feb. | Mar. | Apr. | Jan. | Feb. | Mar. | Apr. | |
| | | | | | | | | | | | | | |

INTERIOR DRAINAGE

| | | | | | | | | | | | | | | | |
|----------------------|---|------|---|----|-----|-----|------|------|---|----|---|----|----|---|-----------|
| HARVEY BASIN | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
| | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
| Idylwild Camp | : | 961A | : | 33 | 20S | 31E | 5200 | 3-31 | : | -- | : | 19 | 22 | : | 13 |
| Izee Summit | : | 964 | : | 28 | 16S | 29E | 5293 | 3-30 | : | 11 | : | 27 | 31 | : | 21 |
| Rock Spring | : | 134 | : | 23 | 18S | 32E | 5100 | 3-31 | : | -- | : | 21 | 27 | : | 9 |
| Star Ridge | : | 247 | : | 20 | 15S | 31E | 5193 | 3-30 | : | 8 | : | 23 | 25 | : | 12 |
| Steers Mountain | : | 963 | : | 35 | 32S | 33E | 6000 | : | : | -- | : | -- | -- | : | -- |
| | : | : | : | : | : | : | : | : | : | : | : | : | : | : | 15.4 |
| WARNER LAKE | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
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| Burnt & Camas Creeks | : | 911 | : | 12 | 39S | 21E | 6200 | 3-27 | : | -- | : | -- | -- | : | 35 |
| | : | : | : | : | : | : | : | : | : | : | : | : | : | : | 13.2:16.7 |
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WEST COAST DRAINAGE

| TERRITORY BASINS (Primary & Secondary & Snow Courses) | Number | Sec. | Twp. | Range | LOCATION | Elevation | Last Survey | AVERAGE SNOW DEPTH (Inches) | | | | AVERAGE WATER DEPTH (Inches) | | | | Water Depth 1936(Inches) |
|---|--------|------|------|---------|----------|-----------|-------------|-----------------------------------|------|------|------|------------------------------------|------|------|------|-----------------------------|
| | | | | | | | | 1937 | | | | 1937 | | | | |
| | | | | | | | | Jan. | Feb. | Mar. | Apr. | Jan. | Feb. | Mar. | Apr. | |
| Big Red Mountain | 729 | 33 | 40S | 1W | 6500 | 3-30 | -- | 64 | -- | -- | 15.0 | -- | 34.1 | 35.6 | | |
| Billie Creek Divide | 722 | 17 | 36S | 5E | 6000 | 3-26 | -- | 57 | 70 | -- | 17.1 | 27.4 | 26.6 | 38.3 | | |
| Fish Lake | 725 | 3 | 37S | 4E | 4865 | 3-25 | -- | 40 | 45 | -- | 10.1 | 17.2 | 16.1 | 18.8 | | |
| Coolwater Gap | 726 | 32 | 32S | 3W | 3000 | 3-29 | -- | 49 | -- | -- | 9.9 | -- | 6.3 | 0.0 | | |
| Geography Mountain | 7215 | 30 | 32S | 3W | 3730 | 3-29 | -- | 83 | -- | -- | 24.2 | -- | 14.3 | -- | | |
| Geography Park | 727 | 9 | 40S | 5W | 6000 | 3-26 | -- | 84 | -- | -- | 21.7 | -- | 34.2 | 27.6 | | |
| Hyatt Prairie Reservoir | 723 | 15 | 39S | 3E | 4900 | 3-27 | 10 | 50 | 48 | 42 | 1.9 | 13.8 | 13.8 | 10.5 | | |
| Lake Red Mountain | 7210 | 25 | 40S | 2W | 6500 | 3-30 | -- | 47 | -- | -- | 11.4 | -- | 27.1 | 27.4 | | |
| Sage Lake No. 1 | 7211 | 3 | 34S | 5E | 6800 | 4-8 | -- | -- | -- | -- | -- | -- | 61.1 | 80.8 | | |
| Seven Lakes No. 2 | 7212 | 26 | 33S | 5E | 6200 | 4-8 | -- | -- | -- | -- | -- | -- | 49.9 | 57.8 | | |
| Silver Lake | 7219 | 30 | 30S | 4E | 3720 | 3-30 | -- | -- | 34 | 34 | -- | 16.3 | 15.2 | -- | | |
| Siskiyou Summit | 728 | 17 | 40S | 2E | 4630 | 3-23 | -- | 42 | 40 | 30 | -- | 8.6 | 14.5 | 1.9 | | |
| South Fork Canal | 7218 | 12 | 33S | 3E | 3500 | 3-31 | -- | -- | 27 | 0 | -- | 11.6 | 0.0 | -- | | |
| Warner Butte | 7213 | 1 | 40S | 1W | 6800 | 3-30 | -- | 47 | -- | 62 | -- | 11.6 | 21.3 | 19.1 | | |
| Whaleback | 7217 | 3 | 31S | 2E | 5140 | 3-29 | -- | -- | -- | 104 | -- | -- | 42.0 | -- | | |
| KLAMATH LAKE BASIN | | | | | | | | | | | | | | | | |
| Anna Springs | 831 | 19 | 31S | 6E | 6018 | 3-31 | -- | -- | 102 | 104 | -- | -- | 37.8 | 43.5 | | |
| Betty 2/ | | 22 | 36S | 12E | 4300 | 3-31 | 4 | 11 | 4 | 0 | 0.7 | 1.5 | 0.0 | 0.2 | | |
| Billie Creek Divide | 722 | 17 | 36S | 5E | 6000 | 3-26 | -- | 57 | 70 | 62 | -- | 17.1 | 27.4 | 26.6 | | |
| Chemult No. 1 | 831 | 21 | 27S | 8E | 4760 | 4-1 | 11 | 31 | 33 | 17 | 1.0 | 7.0 | 10.5 | 8.0 | | |
| Chemult No. 2 2/ | | 21 | 27S | 8E | 4761 | 3-31 | 11 | 31 | 40 | 10 | 1.5 | 6.3 | 10.5 | 5.1 | | |
| Chiloquin 2/ | | 34 | 31S | 7E | 4187 | 3-31 | 7 | 21 | 20 | 0 | 1.0 | 4.2 | 4.0 | 0.0 | | |
| Crystal 2/ | | 26 | 31S | 6E | 4200 | 3-31 | 14 | -- | 40 | 23 | 2.1 | -- | 10.5 | 10.1 | | |
| Fort Klamath 2/ | | 22 | 33S | 7 1/2 E | 4150 | 3-31 | 16 | 27 | 22 | 12 | 2.7 | 4.6 | 8.2 | 4.0 | | |
| Hyatt Prairie Reservoir | 723 | 15 | 39S | 3E | 4900 | 3-26 | 10 | 50 | 48 | 42 | 1.9 | 13.8 | 15.0 | 13.8 | | |
| Kirk 2/ | | 1 | 33S | 7E | 4533 | 3-31 | 14 | 26 | 34 | 10 | 2.0 | 6.0 | 9.5 | 4.5 | | |
| Lake Of the Woods No.1 | 835 | 11 | 37S | 5E | 4460 | 3-30 | 12 | 31 | 37 | 35 | 2.8 | 5.8 | 9.4 | 12.8 | | |
| Lake Of the Woods No. 2 | | 15 | 37S | 5E | 4960 | 3-31 | 19 | 48 | 45 | 40 | 3.2 | 11.0 | 13.2 | 13.5 | | |
| 2/ | | | | | | | | | | | | | | 12.0 | | |

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| TRIBUTARY BASINS (Primary & Secondary & Snow Courses) | Number | LOCATION :Sec. Twp. Range | Elevation | Last Survey | AVERAGE SNOW DEPTH (Inches) 1937 | | | | AVERAGE WATER DEPTH (Inches) 1936 | | | |
|---|--------|------------------------------|--|----------------|---|------|------|------|--|------|------|------------------------------|
| | | | | | Jan. | Feb. | Mar. | Apr. | Jan. | Feb. | Mar. | Apr. |
| | | | | | Date 1937 | | | | | | | Water Depth 1936 (Inches) |
| Quartz Mountain 2/ | : 33 | 37S 16E 5504 | : 3-31: 10 : 20 : 32 : 19 : 1.7: 4.5: 7.2: 9.0: 5.2 | | | | | | | | | |
| Felician 2/ | : 10 | 36S 6E 4200 | : 3-31: 11 : 26 : 22 : 3 : 1.5: 5.5: 7.0: 1.5: 0.4 | | | | | | | | | |
| Richardson Ranch 2/ | : 22 | 35S 14E 4800 | : 3-31: 5 : 17 : 16 : 3 : 0.5: 1.7: 4.7: : 0.0 | | | | | | | | | |
| Rocky Point 2/ | : 26 | 35S 6E 4150 | : 3-31: 12 : 25 : 26 : 6 : 1.4: 5.2: 9.2: 2.6: 0.4: | | | | | | | | | |
| Seven Lakes No. 1 | : 7211 | 3 5E 6800 | : 4-8 : -- : -- : 157 : -- : -- : 61.1: 80.8 | | | | | | | | | |
| Seven Lakes No. 2 | : 7212 | 26 5E 6200 | : 4-8 : -- : -- : 130 : -- : -- : 49.9: 57.8 | | | | | | | | | |
| Summer Rim | : 841 | 15 33S 16E 7200 | : 3-29: -- : 36 : -- : 44 : 14.4: 16.7 | | | | | | | | | |
| Sun Mountain | : 836 | 22 32S 7 1/2E 5350 | : 3-22: -- : -- : 63 : -- : -- : 26.2: --- | | | | | | | | | |
| Taylor Rutte | : 842 | 16 33S 11E 5100 | : 3-31: -- : 21 : -- : 13 : -- : 3.3: --- | | | | | | | | | |
| vansey 2/ | : 19 | 30S 11E 4600 | : : 2 : -- : -- : -- : 0.1: -- : 4.8: --- | | | | | | | | | 0.0 |
| GOOSE LAKE BASIN | : : | : : | : : | : : | : : | : : | : : | : : | : : | : : | : : | : : |
| Quartz Mountain 2/ | : 33 | 37S 16E 5504 | : 3-31: 10 : 20 : 32 : 19 : 1.7: 4.5: 7.2: 9.0: 5.2 | | | | | | | | | |
| Quartz Valley | : 811 | 34 37S 16E 5500 | : 3-27: -- : 25 : -- : 28 : -- : 4.1: -- : 9.4: 10.2 | | | | | | | | | |

1/ The snow measurements are made principally by State watermasters, employees of irrigation and power companies and field personnel of the following Federal Government organizations: Forest Service, National Park Service, Geological Survey, Bureau of Reclamation, Biological Survey, Indian Service, and Bureau of Agricultural Engineering. This work is otherwise conducted cooperatively with the State Engineer of Oregon, Oregon Experiment Station, Oregon Cooperative Snow Surveys, and with the U. S. Weather Bureau.

2/ Water content determined by melting a measured sample. (Calif. Ore. Power Co. Station).

The 1936 water depth in inches is the nearest corresponding measurement to last measurement given for 1937.

